(No Model.)

A. JUNOD.

MUSICAL BOX.

No. 550,917. Patented Dec. 3, 1895.

FIG. 1.

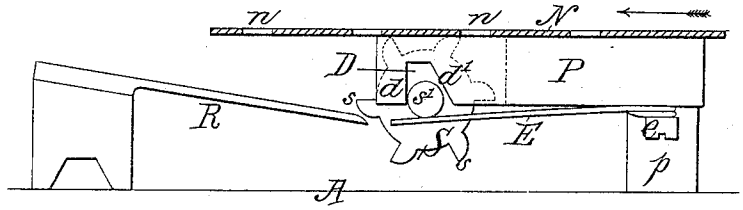


FIG. 2.

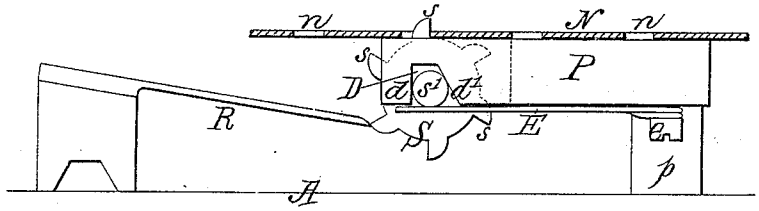


FIG. 4.

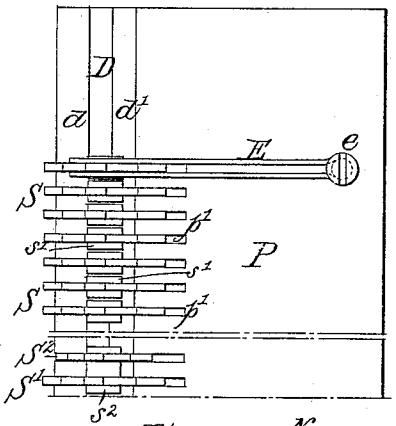
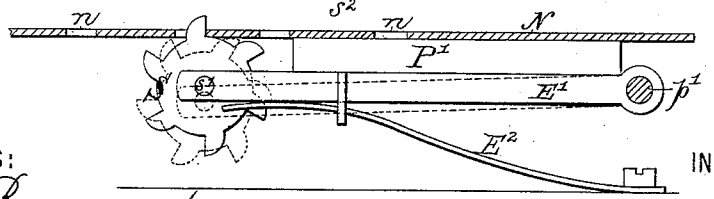


FIG. 3.

FIG. 5.



WITNESSES:

George Baumann

Albert Popkins.

INVENTOR

André Junod

by Howson & Howson

his ATTORNEYS

UNITED STATES PATENT OFFICE.

ANDRÉ JUNOD, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO EMILE L. CUENDET, OF BROOKLYN, NEW YORK.

MUSICAL BOX.

SPECIFICATION forming part of Letters Patent No. 550,917, dated December 3, 1895.

Application filed April 29, 1895. Serial No. 547,471. (No model.)

To all whom it may concern:

Be it known that I, ANDRÉ JUNOD, a citizen of the Republic of Switzerland, and a resident of Jersey City, Hudson county, New Jersey, have invented Improvements in Musical Boxes, of which the following is a specification.

My invention relates to that class of musical boxes in which the musical tongues are caused to vibrate to give the desired musical notes by means of rotary star-wheels which are operated by traveling perforated tune-plates.

The object of my invention is to provide a simple but strong construction of star-wheels and bearings which will be firm and steady, not liable to get out of order, and will avoid unpleasant rattle or clicking which would interfere with the musical notes produced when the musical box is in operation.

In the accompanying drawings, Figure 1 is a sectional view, drawn to an enlarged scale, of sufficient of the operative parts of a musical box to illustrate my invention. Fig. 2 is a similar view, showing the movable parts in other positions. Fig. 3 is a perspective view of one of the star-wheels detached. Fig. 4 is an inverted plan view of a part of the bearing-plate and its star-wheels, and Fig. 5 is a view of a modification.

In the views, A represents a suitable foundation-plate carrying the comb or row of metal tongues R, the vibration of which will give the various musical notes. On the same foundation-plate there is also mounted, by means of suitable posts *p*, the bearing-plate P for the rotary star-wheels S. Over the surface of this bearing-plate P there travels—say in the direction of the arrow, Fig. 1—the tune-plate or note-sheet N, which is preferably of metal and perforated with holes *n* in varying positions, according to the tune desired to be produced, for these holes are adapted to receive the teeth *s* of the star-wheel S, so that as the tune-plate is moved along various star-wheels will be rotated by engagement with the tune-plate, and the corresponding musical tongues R will be caused to vibrate by the action upon it of advance-teeth *s* of the star-wheels as they are turned by the plate.

It will be understood that I use the term "tune-plate" or "note-sheet" in a sufficiently general sense to include any suitable form of the device—as, for instance, where the tune-plate is a cylinder.

I construct each of my independent star-wheels S with journals *g*, as shown in the drawings, and mount these journals in yielding bearings.

In Figs. 1, 2, and 4 I have shown the preferred form of yielding bearing, while in Fig. 5 I have illustrated a modification.

Referring to the constructions shown in Figs. 1 to 4, I provide along the under side of the bearing-plate P grooves D, which may, in fact, constitute a single continuous groove, passing at right angles through the series of grooves or slits *p'*, which receive the star-wheels, as illustrated in Fig. 4. By means of these grooves D, I thus provide in the plate P bearings for the journals *s'* of the star-wheels. While the opposite walls of the bearing-grooves thus formed for the journals of the star-wheels may be parallel with each other to form an accurate fit, I prefer to make the bearing of the tapering or flaring form illustrated in Figs. 1 and 2, somewhat wider at the open under side than the diameter of the journals, while the closed upper end of the bearing is narrower than the diameter of the journals. By this means the journals become self-accommodating in their bearing-grooves.

I prefer to make the outer wall *d* of the bearing practically at right angles to the plane of the tune-sheet N, the flare of the bearing being produced by setting the rear wall *d'* on an incline, as shown. The yielding parts of the bearings for the journals of the star-wheels consist of springs E, upon which the journals of the star-wheels rest and by which they are pressed upward. These springs, upon which the journals of the star-wheels are supported, can be made in any suitable form. They may conveniently be made of spring-wire, as shown, secured at *e* to the under side of the bearing-plate *p*, with

two free ends embracing each star-wheel and bearing on the under side of the journals thereof. These free ends of each spring may be adapted to bear against the opposite faces of the body of the star-wheel to steady its movement.

In Fig. 5 I have shown a modified construction of yielding bearing for the journals of the star-wheels. In this case each independent star-wheel S has its journals s' mounted in bearings in an independent lever E′, pivoted on the under side of the plate P′ to a center or rod p' and acted on by a spring E^2, tending to press the lever E′ up against the plate P′ and the star-wheel into position to have its teeth engage with the perforations of the tune-plate N. The depressed position of the star-wheel and its yielding bearing-lever is indicated by dotted lines.

When a plain portion of the tune-sheet is passing over any star-wheel, the tune-sheet will bear upon two adjacent teeth of the star-wheel, pressing the wheel, as indicated in Fig. 1 and by dotted lines in Fig. 5, downward against the action of its spring-support E, (or E′ E^2.) When in the movement of the tune-sheet N in the direction of the arrow a perforation comes over the star-wheel, the spring support, tending to press the star-wheel up, causes one of the two uppermost teeth in the star-wheel to enter the approaching perforation and so engage with the rear edge of that perforation in the tune-sheet, and accordingly as the latter advances in the direction of the arrow the star-wheel will be turned by the tune-plate and another of its teeth in advance will be caused to act upon the corresponding musical tongue to vibrate it, as illustrated in Fig. 2.

While I prefer to make all my star-wheels individually independent of each other, they may be arranged in independent pairs or sets, such pairs or sets being mounted on the same journal to be actuated by one line of perforations in the tune-sheet, provided they are arranged to act upon a pair or set of musical tongues which will give the notes of a chord. In such case only one of the wheels is made of a diameter to be acted upon by the tune-sheet, the other star wheel or wheels on the same journal being of smaller diameter. I have illustrated this in the lower part of Fig. 4, where the star-wheels S′ and S^2 are shown as mounted upon the same journal a^2. The star-wheel S′ is of a diameter to be acted on by the tune-sheet, while the other wheel S^2 upon the same journal is made of a smaller diameter.

I claim as my invention—

1. In musical boxes, the combination of a perforated tune sheet with independent star-wheels to be actuated thereby, and musical tongues to be vibrated by the star-wheels, each star-wheel having journals and yielding bearings for said journals, substantially as set forth.

2. In musical boxes, the combination of a perforated tune sheet with independent star-wheels to be actuated thereby and musical tongues to be vibrated by the star-wheels, each star-wheel having journals, a plate having bearing grooves for the said journals, and yielding supports for the said journals, substantially as set forth.

3. In musical boxes, the combination of a perforated tune sheet with independent star-wheels to be actuated thereby, and musical tongues to be vibrated by the star-wheels, each star-wheel having journals with flaring bearing grooves for said journals and yielding supports for the journals, substantially as and for the purpose set forth.

4. In musical boxes, the combination of a perforated tune sheet with independent star-wheels to be actuated thereby, and musical tongues to be vibrated by the star-wheels, each star-wheel having journals, a plate having flaring bearing grooves for said journals, the outer wall of each bearing groove being at right angles to the plane of the tune sheet, and yielding supports for the journals of the star-wheels, substantially as and for the purpose set forth.

5. In musical boxes, the combination of a perforated tune sheet, with independent star-wheels to be actuated thereby, and musical tongues to be vibrated by the star-wheels, each star-wheel having journals, a plate having bearing grooves for said journals and springs having free ends adapted to bear on and support the journals of the star-wheels.

6. In musical boxes, the combination of a perforated tune sheet with independent star-wheels to be actuated thereby, and musical tongues to be vibrated by the star-wheels, each star-wheel having journals with a plate having bearing grooves for the journals and springs having free ends to support said journals and to bear upon the faces of the star-wheels, as and for the purpose set forth.

7. In musical boxes, the combination of a perforated tune sheet, with two or more star-wheels, and a common journal to which they are secured, one of the said star-wheels being of a diameter to be acted upon by the tune plate, while the other is smaller, and musical tongues to produce chord notes, to be acted on by the said star-wheels, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDRÉ JUNOD.

Witnesses:
EDITH J. GRISWOLD,
HUBERT HOWSON.